

Case Report

Occupational brucellosis in a veterinary assistant following exposure during management of bovine dystocia: a case report

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ABSTRACT

Brucellosis remains a significant occupational zoonosis in India, particularly affecting workers in the veterinary and livestock sectors who frequently interact with infected animals and reproductive tissues. The disease is caused by gram-negative intracellular coccobacilli of the genus *Brucella*, with *B. abortus* being the predominant species associated with bovine brucellosis. Veterinary personnel performing high-exposure procedures such as dystocia management, placentectomy and handling of aborted materials face the greatest risk due to the heavy bacterial load present in reproductive tissues. We describe a case of acute brucellosis in a 34-year-old veterinary assistant who developed undulant fever, arthralgia, generalized myalgia, malaise and sacroiliac pain after unprotected exposure to reproductive secretions during manual management of bovine dystocia in a herd experiencing multiple late-term abortions. Herd screening revealed widespread *Brucella abortus* positivity. Initial evaluation showed leukopenia and a false-positive Widal test, leading to misdiagnosis as enteric fever. Persistent fever and musculoskeletal symptoms led to further investigation, and *Brucella* IgM ELISA returned strongly positive, confirming acute infection. The patient received WHO-recommended therapy with doxycycline and rifampicin for six weeks, resulting in full recovery without relapse over three months of follow-up. This case highlights the occupational risks faced by veterinary personnel, diagnostic challenges caused by nonspecific symptoms and serological cross-reactivity, and the critical need for strengthened biosafety practices and One-Health-oriented surveillance systems to reduce the burden of brucellosis in endemic regions.

Keywords: Brucellosis, Occupational exposure, Veterinary assistant, Bovine dystocia, Sacroiliitis, *Brucella abortus*

INTRODUCTION

Brucellosis is one of the most widespread bacterial zoonoses globally.¹ It is caused by *Brucella* species, gram-negative intracellular coccobacilli capable of surviving and replicating within macrophages, thereby establishing chronic infection. Human transmission occurs primarily through direct contact with infected animals, reproductive tissues, blood, placental membranes or aborted materials;

inhalation of aerosolized bacteria; or, less commonly, ingestion of contaminated dairy products.²

India remains endemic for brucellosis, particularly in dairy-intensive states, due to inadequate vaccination coverage, unrestricted livestock movement, poor biosecurity and limited awareness among farmers and field veterinarians.³ Veterinary workers-including assistants, inseminators, livestock handlers and field clinicians-form a high-risk occupational group, as their daily duties

involve handling placental tissues, amniotic fluid, uterine contents and aborted fetuses. Obstetric interventions such as dystocia management are exceptionally hazardous because reproductive tissues contain extremely high concentrations of *Brucella* organisms.⁴

Clinically, brucellosis presents with undulant fever, malaise, generalized body pains, night sweats, arthralgia and myalgia. These symptoms overlap significantly with common infections prevalent in tropical countries, such as malaria, dengue, chikungunya, enteric fever and viral fevers, leading to diagnostic confusion.⁵ Musculoskeletal involvement is common and may present as sacroiliitis, spondylitis, peripheral arthritis or chronic back pain. Serological cross-reactivity, particularly false-positive Widal tests, further complicates diagnosis.⁶

This case illustrates occupationally acquired *Brucella abortus* infection following dystocia management in a high-risk herd. The diagnostic pathway, clinical reasoning, therapeutic response and public health implications underscore the importance of PPE adherence and the need for a One-Health approach in endemic regions.

CASE REPORT

A 34-year-old male veterinary assistant presented with a 20-day history of intermittent fever, drenching night sweats, generalized myalgia, arthralgia, malaise and progressively worsening right sacroiliac joint pain. The fever followed an undulant pattern, with evening spikes and relative morning remission. He reported severe fatigue, reduced appetite and difficulty performing routine veterinary duties. There was no history of tuberculosis exposure, chronic illness, diabetes, steroid use or consumption of unpasteurized milk.

Approximately one week before onset of symptoms, he assisted a complicated bovine dystocia in a dairy herd where multiple cows had recently experienced late-term abortions. The dystocia required manual extraction of a dead fetus, removal of retained fetal membranes and handling of copious amniotic and uterine fluids. During the procedure, he wore only thin disposable gloves and lacked full-length obstetric gloves, waterproof protective clothing, goggles or face shield.

Following the abortion outbreak, fifteen cows were screened using *Brucella* IgM ELISA; thirteen tested positives. PCR of pooled reproductive samples confirmed *Brucella abortus* infection.

His initial evaluation at a local clinic showed leukopenia (WBC 2,900/ μ l), ESR 40 mm/h, normal liver and renal profiles, and a Widal test positive for "O" and "H" antigens. He was diagnosed with enteric fever and treated with intravenous ceftriaxone for five days. Fever briefly subsided but recurred a few days after completion of therapy, accompanied by worsening back and sacroiliac pain.

On presentation to us, he was febrile (38.7°C), ill-appearing and pale. Localized tenderness over the right sacroiliac joint was elicited on FABER and Gaenslen's tests. No lymphadenopathy, hepatosplenomegaly or neurological deficits were present. Differential diagnoses included enteric fever relapse, tuberculous sacroiliitis, spondyloarthropathy, viral fever and brucellosis.

Given his occupational exposure and newly discovered herd positivity, *Brucella* IgM ELISA was repeated and returned strongly positive. Blood culture was recommended but declined due to financial limitations.

A diagnosis of acute brucellosis with sacroiliitis was made. Doxycycline 100 mg twice daily and rifampicin 600 mg once daily were initiated. At follow-up after two weeks, fever had subsided, sacroiliac pain had improved markedly and appetite had returned. At six weeks, complete symptom resolution was achieved. He remained asymptomatic at three-month follow-up.

DISCUSSION

This case highlights the significant occupational hazards associated with veterinary fieldwork in India, particularly during obstetric procedures involving cattle. Brucellosis remains a major zoonosis globally and is well documented in regions where livestock density is high and biosafety measures are inconsistently followed.¹ The patient acquired infection following manual dystocia management, an intervention known to expose veterinary personnel to large quantities of infected reproductive fluids.

The clinical manifestations of human brucellosis are diverse and frequently nonspecific. Classical undulant fever, malaise, night sweats, arthralgia and myalgia are common but are also features of many tropical infections.⁹ Musculoskeletal involvement is particularly characteristic and may present as sacroiliitis, as seen in this patient, or as spondylitis, peripheral arthritis or generalized back pain. Sacroiliitis in brucellosis often results from hematogenous spread of the organism to the synovium, producing inflammation of the sacroiliac joint. Because these manifestations overlap with tuberculosis, spondyloarthropathy and mechanical injuries, diagnosis may be delayed.

In India, diagnostic pitfalls are common due to overlapping presentations and cross-reactive serology. The false-positive Widal test in this case reflects antigenic cross-reactivity between *Brucella* and *Salmonella* antigens.¹⁰ Such errors contribute to misdiagnosis and unwarranted antibiotic administration, emphasizing the importance of clinical suspicion, particularly in individuals with occupational exposure.

The diagnostic approach to brucellosis typically includes serology, with ELISA being the most widely available, sensitive and practical method in India.¹¹ Blood cultures

remain the gold standard, but require prolonged incubation, special laboratory facilities and increased costs, making them less accessible in rural and semi-urban settings. PCR offers a rapid and sensitive alternative, but is limited by availability and cost.

The treatment of brucellosis aims to eradicate the intracellular organism and prevent relapse. Combination therapy with doxycycline and rifampicin is well established and recommended by the world health organization.¹² This regimen provides high intracellular penetration and bactericidal activity. Relapse rates range from 5-10%, often due to inadequate treatment duration or poor compliance.¹³ In this case, clinical improvement was observed within two weeks, and complete recovery occurred by six weeks with no relapse on follow-up.

Prevention of occupational brucellosis requires strict adherence to personal protective equipment (PPE) protocols during high-risk procedures such as dystocia management, placentectomy and handling of aborted materials.¹⁴ Long-sleeved obstetric gloves, waterproof gowns, boots, goggles and face shields should be mandatory. Unfortunately, in many rural Indian veterinary settings, PPE use is inconsistent due to logistic, financial and cultural barriers. Strengthening veterinary biosafety practices is essential for reducing risk.

From a public health perspective, brucellosis control requires a comprehensive One-Health approach that integrates human and veterinary health sectors. This includes systematic livestock vaccination, movement control, herd-level surveillance, prompt reporting of abortions and educational outreach to farmers and field veterinary staff.¹⁵ Improved diagnostic access in rural areas, coupled with heightened clinician awareness, can significantly reduce delays in diagnosis and prevent complications.

This case underscores the necessity of linking individual clinical events with broader public health strategies. Early identification of high-risk exposures, combined with appropriate PPE, rapid diagnostic testing and timely therapy, can reduce the burden of brucellosis in endemic regions.

CONCLUSION

Brucellosis is a significant occupational risk for veterinary personnel involved in livestock handling, particularly during obstetric procedures that involve direct contact with reproductive tissues. This case illustrates the diagnostic challenges posed by nonspecific symptoms and serological cross-reactivity, the importance of clinical suspicion in high-risk individuals, and the effectiveness of early combination antibiotic therapy in achieving full recovery. Implementing stringent biosafety measures, improving access to diagnostic facilities and strengthening One-Health collaborations are essential steps toward reducing

zoonotic transmission of brucellosis in the endemic regions.

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